

REMARKS

Claims 1-16 are pending in this application. By this Amendment, claims 1 and 16 have been amended, and claims 17-26 have been canceled without prejudice to, or disclaimer of, the subject matter found therein. No new matter has been added.

In paragraph 1, on page 3 of the Office Action, claims 1-4, 6-8, 10, 12, 13 and 16 were rejected under 35 U.S.C. §102(b) as being anticipated by Pankert et al. (Pankert), U.S. Patent No. 5,729,264. The rejection is respectfully traversed.

Pankert fails to disclose a microcrack region formed in the plate member between neighboring active portions, the microcrack region including a large number of microcracks therein, as recited in claims 1 and 16.

In Pankert, the recording head comprises a piezoelectric actuator element 7 in the form of a plate that consists of a plurality of layers of a ceramic piezoelectric material alternated within electrode layers (col. 4, lines 1-5). The actuator plate 7 has slits 39 that extend through the active part of the actuator plate beyond the first zone 75 (col. 5, lines 24-26). Due to the slits, the actuator plate 7 is split into a plurality of fingers 40 (col. 5, lines 26-28). The slits 39 extend through the actuator 7 in a perpendicular direction to the plane of the actuator plate 7 (Figs. 2 and 3). Accordingly, each slit is an opening that extends along the thickness of the piezoelectric ceramic plates. Thus, each region has one slit 39 that is an opening with nothing there.

A similar structure to Pankert is described in Applicant's Background where it explains that there is a problem in the process of forming the slits that extend along the thickness of the piezoelectric ceramic plates. In particular, cutting the slits with a diamond cutter is very troublesome and because a washing process is necessary after the slit formation process, it can take a long time to complete the process, which results in manufacturing inefficiencies (page 7, paragraph [0014]). Applicant's pressure generating mechanism, on the

other hand, includes microcrack regions where a large number of microcracks are formed (page 19, paragraph [0033]). As Applicant explains, one of the advantages, for example, is that the microcrack can be formed without using a diamond cutter, unlike the case of forming slits extending along the thickness of the plate member, the microcracks can be easily formed in a short time (page 9, paragraph [0017]). Additionally, because the microcrack region is formed in the plate member between the neighboring active portions, crosstalk between the neighboring active portions can be reduced (page 9, paragraph [0017]). Pankert fails to disclose this feature.

Also, unlike Applicant's microcrack regions which are solid, Pankert's slits are in fact cut regions with nothing there. At most, in Pankert, each region has one slit whereas Applicant's microcrack regions include a large number of microcracks. Furthermore, a slit by definition is not a crack. A slit is defined as "a long, straight, narrow cut or opening" whereas a crack is defined as "to break or snap apart" (American Heritage College Dictionary).

Thus, Pankert does not literally disclose each and every feature of Applicant's claimed invention as recited in claims 1 and 16, and the rejection under 35 U.S.C. §102 is inappropriate. Further, for the reasons discussed, Pankert does not suggest the features as recited in claims 1 and 16.

Because Pankert does not anticipate or suggest the recited features of claim 1, Pankert cannot possibly anticipate or suggest the subject matter of claims 2-4, 6-8 and 10-13, which depend from claim 1 for the reasons discussed with respect to claim 1, and for the additional features recited therein. It is respectfully requested that the rejection be withdrawn.

In paragraph 2, on page 6 of the Office Action, claims 1-4, 6-8, 10, 12, 13 and 16 were rejected under 35 U.S.C. §102(b) as being anticipated by Ohashi, U.S. Patent No. 6,354,685. The rejection is respectfully traversed.

Ohashi fails to disclose a microcrack region formed in the plate member between neighboring active portions, the microcrack region including a large number of microcracks therein, as recited in claims 1 and 16.

In Ohashi, the piezoelectric element 3 is split into the driving piezoelectric block 6 and the support piezoelectric block 7 by forming slits which are deeper than the thickness of the layers of the internal electrodes 9-1 and 9-2 so that the driving piezoelectric block 6 can move independently from the support piezoelectric blocks 7 (col. 10, lines 46-51). Fig. 3 of Ohashi clearly shows that the slits extend through the thickness of the internal electrodes, which is perpendicular to the plane of the piezoelectric element 3. Each one of Ohashi's slits is a cut opening with nothing there. Thus, Ohashi fails to disclose a microcrack region formed in the plate member between neighboring active portions, the microcrack region including a large number of microcracks therein, as recited in claims 1 and 16.

As discussed above, Applicant also describes a similar structure to Ohashi in Applicant's Background, where the Applicant describes that the process itself for forming the slits extending along the thickness of the piezoelectric ceramic plates, with a diamond cutter, is very troublesome (page 7, paragraph [0014]. As the Applicant describes, the washing process that is necessary after the slit formation process requires a long-time work. This results in the problem of manufacturing inefficiencies (page 7, paragraph [0014]). As further discussed above, unlike the case of forming slits extending along the thickness of the plate member, the microcracks can be formed without using a diamond cutter, and the microcracks can be easily formed in a short time (page 9, paragraph [0017]). As Applicant describes, because the microcrack region is formed in the plate member between neighboring active portions, crosstalk between the neighboring active portions can be reduced. In addition, because crosstalk can be reduced, the number of layers in the plate member can be increased relatively to the prior art (page 9, paragraph [0017]). Ohashi fails to disclose this feature.

Also as discussed above, unlike Applicant's microcrack regions which are solid, Ohashi's slits are in fact cut regions with nothing there. At most, in Ohashi, each region has one slit whereas Applicant's microcrack regions include a large number of microcracks. Furthermore, a slit is not a crack. As discussed above, a slit is defined as "a long, straight, narrow cut or opening" whereas a crack is defined as "to break or snap apart" (American Heritage College Dictionary).

Thus, Ohashi does not literally disclose each and every feature of Applicant's claimed invention, as recited in claims 1 and 16, and the rejection under 35 U.S.C. §102 is inappropriate. Further, for the reasons discussed, Ohashi does not suggest the features as recited in claims 1 and 16.

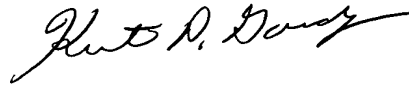
Because Ohashi does not anticipate or suggest the recited features of claim 1, Ohashi cannot possibly anticipate or suggest the subject matter of claims 2-4, 6-8, 10, 12 and 13, which depend from claim 1 for the reasons discussed with respect to claim 1, and for the additional features recited therein. It is respectfully requested that the rejection be withdrawn.

Furthermore, Applicant respectfully request rejoinder and allowance of claims 5, 9, 11, and 14-15. Claims 5, 9, 11, and 14-15 directly and/or indirectly depend from allowable claim 1. Claims 5, 9, 11, and 14-15 are allowable for at least the same reasons that claim 1 is allowed.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-16 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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